

GF Issue Characterization: Invasive/Exotic Species

Problem Statement:

Invasive/exotic species are established in some waters of the Gulf of the Farallones Sanctuary and have the potential to cause ecological and economic degradation to the affected coastal area. If detection, preventative measures and eradication efforts are not taken, further introduction and spread of exotic/invasive species will continue in and adjacent to the Sanctuary, impacting both Sanctuary living resources and marine habitats.

Issue Description:

In the context of the West Coast National Marine Sanctuaries exotic/invasive species in the marine/estuarine environment are defined as a plant, invertebrate, fish, amphibian, bird, reptile, virus, bacteria, algae or mammal whose natural zoogeographic range would not have included the waters of the Eastern Pacific without passive or active introduction through anthropogenic means. The Gulf of the Farallones National Marine Sanctuary is close to San Francisco Bay. San Francisco Bay is the most invaded aquatic ecosystem in the world, with over 255 introduced species. According to the California Department of Fish and Game "invasive species are the number two threat to rare, threatened or endangered species nationwide, second only to habitat destruction". In general, exotic/invasive species in the marine/estuarine environment alter species composition, threaten the abundance and/or diversity of native marine species, interfere with the ecosystem's function and disrupt commercial and recreational activities. Although several exotic/invasive species have been identified in the bays and estuaries throughout the range of the Gulf of the Farallones Sanctuary, a complete inventory is needed.

Nearshore discharge of ballast water is a common source of introduction of exotic/invasive species. Most organisms carried in ballast water are in the larval or diapause stage of their life cycle. Once discharged, estuaries and harbors provide optimal environments for the growth of these organisms. Viruses, bacteria and all major and most minor phyla have also been identified in ballast water. With over 45,000 commercial cargo ships (6,000 vessels entering or exiting San Francisco per year) transporting 10 billion tons of ballast water around the globe every year, the rate of introduced species will be certain to grow if efforts to prevent introductions do not occur.

Exotic/invasive species may also be transported on commercial and recreational vessel hulls, rudders, propellers, intake screens, ballast pumps and sea chests. Other vectors for the spreading of exotic species include recreational equipment, debris, dredging and drilling equipment, dry docks and buoys. Animals purposely transported for research, organisms used for restoration, educational activities, aquarium activities, live bait, aquaculture, biological control, live seafood, and rehabilitated and released organisms, also have the potential for accidental or intentional release into the marine/estuarine environment.

How are Other National Marine Sanctuaries Addressing This Issue?

Exotic species introductions are a problem throughout coastal communities, and within all National Marine Sanctuaries. Within the National Marine Sanctuary System, the Florida Keys NMS does have a prohibition on introducing exotic species. The Channel Islands Sanctuary is also proposing a prohibition on the introduction of exotic species. To date, no National Marine Sanctuary has developed a comprehensive eradication program, reporting system or education and outreach program targeting industry and the public. GFNMS has an opportunity, working together with other partners, to develop an education/outreach model that could potentially be adopted by other sanctuaries.

How Has This Issue Been Dealt With in Another Place or By Another Agency? International:

"Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens" Resolution A.868(20) –Nov. 20, 1997:

Developed by the International Maritime Organization (IMO). These guidelines, which outline the techniques for minimizing introductions from cargo ship ballast discharge, are expected to become part of the International Convention for the Prevention of Pollution from Ships (MARPOL). This would require U.S. Congress to enact legislation detailed in the guidelines.

"International Council for Exploration of the Sea (ICES) Code of Practice Concerning Introductions and Transfers of Marine Species":

A regulatory framework for member states to use in managing the introduction of non-native species. This Code of Practice is continually modified to incorporate new scientific knowledge.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):

Developed by the United Nations, signed by the U.S. in 1975. Designed to restrict trade in listed species to protect depletion in the habitat of origin.

The International Plant Protection Convention (IPPC):

Developed by the United Nations, signed by the U.S. in 1972 with 94 other countries. Designed to prevent the introduction and spread of agricultural pests.

Federal Law:

Executive Order 13112, February 1999

Directs Federal Agencies to prevent the introduction of invasive species and provide for their control: establishes the Invasive Species Council and directs them to write an invasive species management plan within 18 months.

National Invasive Species Act, 1996

The Federal National Invasive Species Act strengthened the 1990 law requiring open water exchange (OWE) of ballast water and mandatory ballast management plans and reporting.

Title 50, U.S. Code of Federal Regulations; 58976-58981, 1993:

Enforced by U.S. Fish and Wildlife Service, Dept. of Interior, prohibiting importation of specific disease agents of salmonid fish.

Federal Noxious Weed Act of 1974 (amended 1990), Federal Plant Pest Act (1957) and Plant Quarantine Act (1912):

Gives the U.S. Dept. of Agriculture the authority to regulate the movement of plants, plant products, plant pests and their vectors. Also regulates the introduction of genetically engineered organisms.

Lacey Act of 1900 (revised 1981):

Regulates the importation of certain listed animal species.

State Law:

In October 1999, AB703 was signed into California State law. The Bill requires mid-ocean ballast water exchange in waters more than 200 nautical miles from land and in water at least 2000 meters deep or retention of all ballast water on board the vessel for all U.S. and foreign vessels that enter California waters after operating outside the U.S. Exclusive Economic Zone. "Good Housekeeping" practices must be observed which includes the avoidance of discharge or uptake near marine sanctuaries, reserves, parks, coral reefs and other areas. Sanctuary prohibition on introducing or releasing an exotic species provides a greater impetus for vessels to comply with AB703 as the Sanctuary may enforce civil penalties up to \$119,000 per violation per day. The Sanctuary prohibition is applicable to Federal as well as State waters.

Fish and Game Code: Section 2116-2126 (illegal transportation of certain species)

Fish and Game Code: Section 6300-6306 (infected, diseased or parasitic fish, amphibia or aquatic plants)

Fish and Game Code: Section 6430-6433 (Ballast Water Management)

Fish and Game Code: Section 6440-6460 (control of aquatic nuisance plants)

Fish and Game Code: Section 8596-8598 (marine aquaria pet trade)

Public Resources Code: Section 71210-71213 (ballast water)

Public Resources Code: Section 71215 (Exotic Species Control Fund)

Hundreds of Federal programs, State organizations, international organizations and non-profit organizations have established databases, community outreach, monitoring, eradication and research and education programs. Additionally, industry is working on a number of physical, biological and chemical means of treating or controlling organisms in ballast water.

What are the Various Points of View on the Issue?

- Diverging views on whether eradication does or does not work
- Diverging views on whether eradication is the best use of limited funds
- Diverging views on whether education and outreach can be effective in slowing down the numbers of introduced species
- Diverging views on whether a regulatory approach can be effective and how this would be enforced

What Information Gaps are We Aware of at This Time?

- Have not been able to locate inventory of existing education/outreach programs
- Have not been able to locate inventory of existing monitoring programs (including volunteer programs)
- Have not been able to identify extent of invasion throughout range of GFNMS
- Have not determined all pathways of introduction into GFNMS

What Other Related Issues Came Up During Scoping?

- Prohibit those activities that could result in the introduction of non-native disease and species
- Prohibit disposal of ballast water in Sanctuaries to reduce threat of introduction
- Limit the spread of non-native oysters in Tomales Bay by commercial culture operations
- Develop and implement invasive species protection plan
- Develop alternative ways of eliminating the transmittal of invasive species through ships' ballast water
- Create policy on discharges and invasives related to cruise ships
- Support/develop outreach programs for boaters regarding hull cleaning and boat washing

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